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(71)(72) Applicant and Inventor: GALLO, Michele, Antonio [IT/IT]; Via Germanico, 55, I-00192 Roma (IT).

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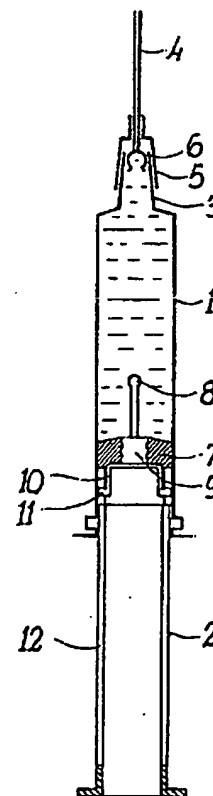
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With international search report.

(54) Title: SAFETY (SECURITY) SYRINGE

(57) Abstract

A hypodermic syringe is disclosed providing means for preventing reuse. After completion of an injection at the end of the injection stroke a fixing male element (8) protruding distally from the piston head (7; 9) engages the needle end by snapping in into a female fixing element (6) connected thereto. During an attempted refilling of the syringe by another dosis of medicament the needle (4) is disconnected from its coupling element (5) and retracted into the syringe cylinder (1). The piston head also includes locking means consisting of two elastically biased wings (11) irreversibly engageable in coinciding seats provided at the end of the cylinder wall.



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DescriptionSafety (security) syringe

This innovation has as object a security syringe and more particularly a syringe provided with a mechanism which consents to avoid, after its normal use, the risk of infection, accidentally or unvuntarily, by the needle.

The problem faced by this is resolved by the object of this innovation, is surely one of the most topical, and its dramaticism is increasing little by little with the spreading of diseases which are transmitted by blood.

It happens always more often to hear of cases of people who caught diseases simply wounded accidentally with a needle of a syringe.

That matter, the actual structure of the mon use syringe is such, unless the person who makes use of it, is not particularly concientious and afterwards covers the needle, after the infiltration, with its proper cap, the needles are throwing away without any protection, and that's why they become a real danger.

In this context, also in the light of the extreme dangerousness of the diseases which are contracted in this way, the importance of the syringe, proposed according this innovation, appears obviously, which forsees a mechanism by which, after having carried out the normal infiltration, the needle is coupled by the piston of the syringe and then drawn back inside the cylinder, so that the possibility of any subsequent contact with a person by the needle, is avoided.

This innovation made up by a specific object, a mon-use syringe, comprising a cylinder, open on the back end, a piston, sliding internally in the above mentioned cylinder, and a needle, able to be coupled,

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to the front-end, of the above-mentioned cylinder, by a male-coupling system, provided on the cylinder, female, provided on the needle, which consents the passing of the liquid from the cylinder to the needle, the above
5 mentioned needle is provided, on the back end, coinciding with the above-mentioned female-coupling, of a further coupling-element for fixing, and is so coupled with the above-mentioned female-element that it can slid towards the inside of the cylinder, and where on the front-
10 end of the above-mentioned piston a fixing-coupling is provided,, able to be coupled when the piston arrives the end of his stroke forwards on the inside of the cylinder, with the above-mentioned further coupling element for fixing the needle, so to draw back the
15 needle itself into the inside of the cylinder during his back-stroke.

In a preferred form of realization of the syringe according the innovation, the above-mentioned fixing coupling can be disposed on the piston by a support
20 provided with fastening-craft on the lower-terminal part of the inside wall of the cylinder, at the end of the return-stroke of the piston, so to avoid the possibility to re-extract the needle out of the cylinder.

25 Particularly, the above-mentioned fastening craft may be constituted by two elastic wings, provided on the lower-side with relieves that are coupled with coinciding seats carried out on the wall of the cylinder.

30 The above-mentioned fixing-coupling support can be disposed on the above-mentioned piston in an uncoupled way, so that when the fixing with the inside wall has taken place, the piston can slid towards the inside of the cylinder, leaving in fixed position the
35 whole coupling-support for fixing the needle, in this case, the piston is provided with external grooves which consent the sliding over the above-mentioned

relieves.

Preferably, the coupling between the needle and the piston is realized by a male-element, disposed on the front-end of the above-mentioned piston, so shaped to be fit in by the male coupling-element between cylinder and needle, and by a female element, carried by the needle inside of the female coupling-element cylinder-needle, in which the above-mentioned male element, carried by the piston, fixes itself, on the end of his forward-stroke in the inside of the cylinder.

This innovation will be now described according its preffered realization forms with particular reference to all the illustrations of the drawing enclosed in which:

Figure 1 is a first sight in vertical section of the syringe according the innovation;

Figure 2 is a second sight in vertical section of the syringe according the innovation;

Figure 3 is a third sight in vertical section of the syringe according the innovation; and

Figure 4 is a fourth sight in vertical section of the syringe according the innovation.

With reference to the drawing enclosed you can notice the syringe according the innovation including a cylinder 1 and a piston 2, coupled on the back-end of cylinder 1.

On the front-end, the cylinder 1 has a protusion, peforated, on which the needle 4 will be coupled.

Needle 4 has a coupling element 5, which inserts itself around the above-mentioned protusion 3, inside the above-mentioned coupling-element 5, the needle 4 has a female fixing-element 6.

The coupling between needle 4 and element 5 allows the needle itself to slid to the inside of the syringe.

On the piston 2 is a packing-element 7, through which protudes a male element 8 which can inserts itself through the protusion 3 and is able to couple

itself with the female element 6.

The above-mentioned male element 8 is coupled with a support 9, disposed below the above-mentioned packing-element 7.

5 Support 9 has, on its side, two elastic-elements 10 furnished with protuberances 11 which are coupled with corresponding openings, carried out on the lower terminal part of cylinder 1.

10 On the piston 2 are further more two longitudinal grooves provided corresponding with the above-mentioned protuberances.

The syringe according the innovation, after having set the needle 4 in position on the protusion 3 and having sucked the liquid to infiltrate (figure 1) will
15 be used for the injection according the normal process.

When the piston 2 has arrived the end of his stroke and the injection is finished, it's enough to push the piston 2 slightly up to obtain the coupling between the female element 6 and the male element 8 (figure 2).

20 Bringing back the piston 2 along the cylinder 1, the needle 4 is drawn back into the inside of the cylinder, avoiding every other possible contact with the needle (figure 3).

The protuberances 11 couple temselves with the
25 openings of the cylinder 1 blocking the support-structure 9 - male element 8 - needle 4 into the inside of cylinder 1 itself, so when the piston 2 removes up, the needle remains blocked in the inside of cylinder 1.

This innovation has been described with specific
30 reference to some of his preferred forms of realization, but of course variation and/or modification can be made by experts of the branch without, for this, getting out of the relative sphere of the protection.

Claims

1. Syringe mon-use comprising the cylinder, open on the back-end, a piston, sliding inside of the above mentioned cylinder and a needle, able to be coupled with the front-end, on that cylinder by a male-coupling
5 system, provided with the cylinder, female, provided with the needle, which consents the passing of the liquid from the cylinder to the needle, characterized by the fact that the above-mentioned needle is provided, on the back-end, corresponding with the above-mentioned
10 female-coupling, of a further coupling-element for fixing and is so coupled with the above-mentioned female-element that it can slide towards the inside of the cylinder, and by the fact that, on the front-end of the above-mentioned piston, a fixing-coupling is
15 provided, able to be coupled, when the piston arrives the end of his forward-stroke in the inside of the cylinder, with the above-mentioned further coupling-element for fixing of the needle, so to draw back the needle itself into the inside of the cylinder during
20 its back-stroke.

2. Syringe according claim 1, where the above-mentioned fixing-coupling is disposed on the piston by a support provided with fastening craft on the lower
25 terminal part of the inside wall of the cylinder so to avoid the possibility to re-extract the needle out of the cylinder.

3. Syringe according claim 2 where the above-mentioned fastening craft are constituted by two
30 elastic wings, provided on the lower-side with relieves that are coupled with coinciding seats carried out on the wall of the cylinder.

35 4. Syringe according claims 2 or 3, where the above mentioned fixing-coupling support is disposed on the

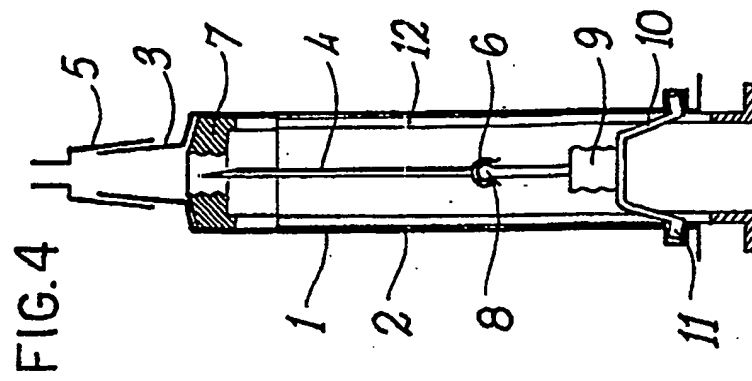
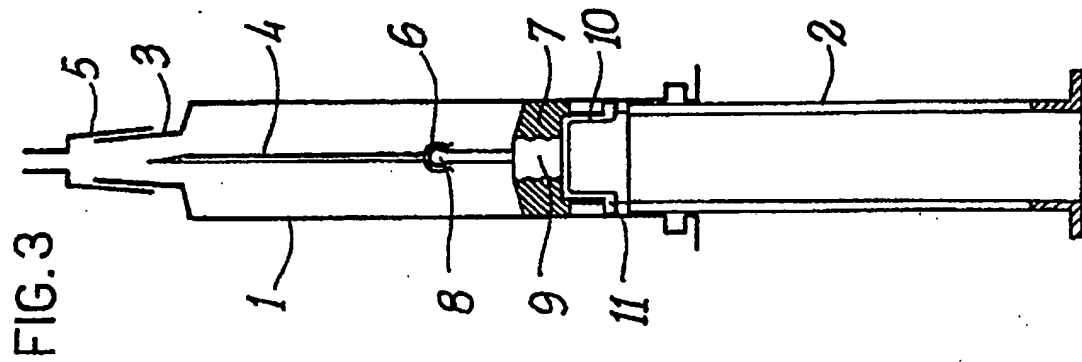
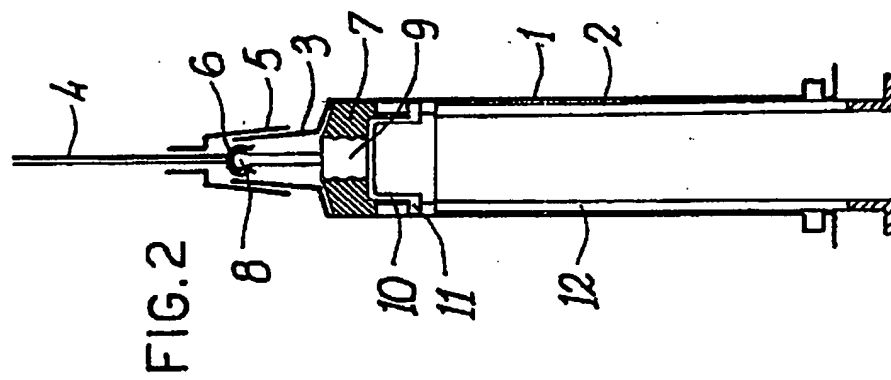
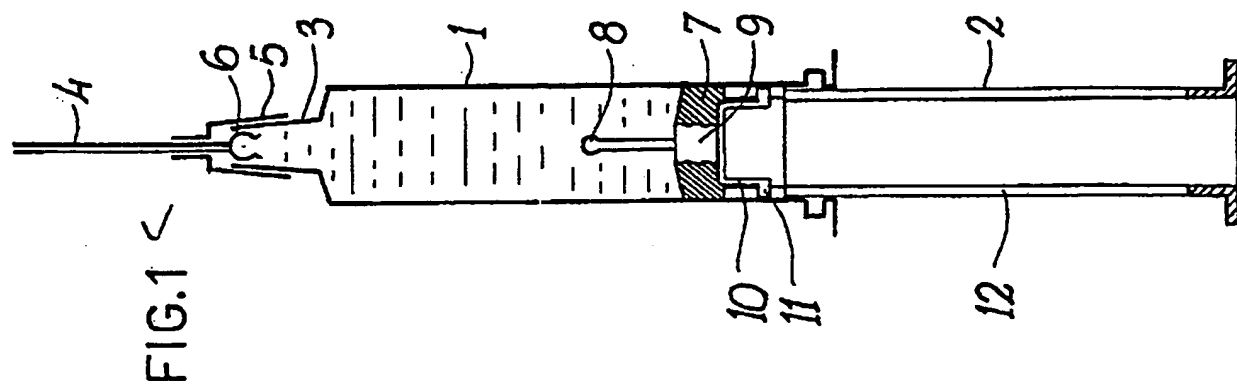
-6-

above-mentioned piston in an un-coupled wy, so that when the fixing with the inside wall of the cylinder has taken place, the piston slides up, leaving in fixed position the whole coupling-support for fixing the
5 needle; the above-mentioned piston provided with external grooves, which consent the sliding over the above-mentioned fastening-craft.

5. Syringe according one of the previous claims
10 where the coupling between needle and piston is realized by a male-element, disposed on the front-end of the above-mentioned piston, so shaped to be fit in by the male coupling-element between cylinder and needle, and by a female element, carried by the needle, inside the
15 female-coupling element of the cylinder-needle, in which the above-mentioned male-element, carried by the piston, fixes itself on the end of his forward stroke in the inside of the cylinder.

20 6. Safety (security) syringe according all of the previous claims.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/IT 91/00030

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC ⁵ : A 61 M 5/32		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC ⁵	A 61 M	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched *		
III. DOCUMENTS CONSIDERED TO BE RELEVANT *		
Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X,P	EP, A, 0364387 (SEGUI PASTOR et al.) 18 April 1990 see the whole document --	1-5
X	EP, A, 0321903 (S. DOLGIN) 28 June 1989 see column 11, lines 11-51; figures 11,12 --	1,5
X	WO, A, 8909075 (DAVSA SEVENTY-FIFTH PTY. LTD.) 5 October 1989 see page 3, lines 12-24; page 5, lines 21-26; page 6, line 25 - page 7, line 21; figures 1,2,4 --	1
A		5
A	WO, A, 8904681 (SPRUSON & FERGUSON) 1 June 1989 see figures 1-5 -----	1,5
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>* Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the International filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the International filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
10th July 1991	30. 08. 91	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	F.W. HECK	

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

V. ☒ OBSERVATION WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE ¹

This International search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim numbers _____ Authority, namely: _____ because they relate to subject matter not required to be searched by this
2. ☒ Claim numbers 6 because they relate to parts of the International application that do not comply with the prescribed requirements to such an extent that no meaningful International search can be carried out, specifically: see PCT Rule 6.2(a)
3. ☐ Claim numbers _____ because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 8.4(a).

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING ²

This International Searching Authority found multiple inventions in this International application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International search report covers all searchable claims of the International application
2. ☐ As only some of the required additional search fees were timely paid by the applicant, this International search report covers only those claims of the International application for which fees were paid, specifically claims: _____
3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers: _____
4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

- ☐ The additional search fees were accompanied by applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

IT 9100030

SA 46844

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 07/08/91. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE		KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE P27126NL00/JPO/IMO	
Nederlands aanvraag nr. 1025669		Indieningsdatum 09 maart 2004	
		Ingeroepen voorrangsdatum	
Aanvrager (Naam) APIS B.V			
Datum van het verzoek voor een onderzoek van internationaal type		Door de instantie voor Internationaal Onderzoek (ISA) aan het verzoek voor een onderzoek van internationaal type toegekend nr. SN 42885 NL	
I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)			
Volgens de internationale classificatie (IPC) Int.Cl.7: A61M5/50 A61M5/315			
II. ONDERZOChte GEBIEDEN VAN DE TECHNIEK			
Onderzochte minimum documentatie			
Classificatiesysteem	Classificatiesymbolen		
Int.Cl.7:	A61M		
Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen			
III. <input type="checkbox"/> GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES (opmerkingen op aanvullingsblad)			
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IPC 7 A61M5/50 A61M5/315

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B. ONDERZOCHETE GEBIEDEN VAN DE TECHNIEK

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IPC 7 A61M

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C. VAN BELANG GEACHTTE DOCUMENTEN

Categorie *	Geciteerde documenten eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
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13 December 2004

Verzenddatum van het rapport van het nieuwheidsonderzoek van internationaal type

Naam en adres van de instantie

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De bevoegde ambtenaar

Sedy, R

C (Vervolg) VAN BELANG GEACHTE DOCUMENTEN		
Categorie *	Geciteerde documenten eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr
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